PART III – SECTION J, ATTACHMENT F-4

NOAA/INL METEOROLOGICAL RESEARCH PARTNERSHIP
INTERAGENCY AGREEMENT STATEMENT OF WORK

Effective October 1, 2018 – September 30, 2023

NOAA/INL METEOROLOGICAL RESEARCH PARTNERSHIP
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FISCAL YEARS 2019-2023

This Statement of Work (SOW) describes work to be accomplished in a five-year interagency agreement between the Department of Commerce National Oceanic and Atmospheric Administration (NOAA) and the Department of Energy Idaho Operations Office (DOE-ID) to support meteorological activities in Idaho of benefit to both departments. The five-year period begins in October 2018 and ends in September 2023. Under the agreement, NOAA will provide meteorological support to the DOE-ID Idaho National Laboratory (INL) while also contributing to NOAA's mission to understand and predict changes in climate and weather. The work tasks are based on NOAA discussions with DOE-ID and INL personnel, recommendations of the DOE Meteorological Coordinating Council, and general guidance in the 1989 report entitled "Modernization of the INEL Meteorological Monitoring and Emergency Response Capability: A General Design." Other guidance and orders that have been used in preparing this SOW include: the Clean Air Act, DOE Order 458.1, DOE Order 151.1D and associated guides, DOE Handbook DOE-HDBK-1216-2015, ANSI/ANS-3.11-2015, and other general industry practices and standards.

The fiscal year 2019-2023 agreement is a continuation of a long-term relationship between NOAA and DOE-ID known as the NOAA/INL Meteorological Research Partnership. To continue the partnership over the agreement period, NOAA's Air Resources Laboratory Field Research Division (ARLFRD) will support five tasks: 1) agreement oversight and reporting; 2) operation of a mesoscale network of meteorological stations known as the NOAA/INL Mesonet, including activities related to quality assurance of the data; 3) distribution of NOAA/INL Mesonet data to users; 4) INL weather forecasting and Emergency Operations Center (EOC) support; and 5) atmospheric modeling and research in support of INL activities and NOAA's mission.

Supporting these tasks requires the annual effort of approximately 6 full-time equivalent (FTE) employees. However, some ARLFRD employees supporting the agreement spend a portion of their time working on research projects funded by NOAA or other organizations. The 6 FTE effort is therefore spread over more than six employees. The estimated effort for each task is divided according to general labor categories required to perform the work. A given task might require the skills mix of several categories. The ARLFRD Director will exercise discretion in assigning individual workloads and ensuring the accomplishment of the tasks. In addition to labor costs, full support of the agreement requires funds for building rent, equipment, and other non-labor expenses.

It is envisioned that the major tasks of this SOW will remain relatively constant over the life of the agreement, but specific tasks may require modifications due to an evolution in requirements. Tasks supported by the agreement may evolve due to changes in focus at the INL Site. Additionally, the costs of supporting certain tasks could change unexpectedly due to new regulations, such as new safety requirements. As long as any activity modifications continue to fall within the five existing tasks and do not result in significant changes to the overall agreement costs, the ARLFRD Director will make any necessary staff scheduling adjustments to account for the changes. Should modifications entail significant changes to the labor or other costs associated with the agreement, NOAA and DOE-ID will mutually agree upon a revised SOW and budget consistent with the modified tasks.

TASK LIST

1. **Agreement Oversight and Reporting**
   - Provide planning, management, and oversight of ARLFRD personnel in support of the agreement.
   - Maintain and oversee ARLFRD's budget for the agreement.
   - Prepare and submit quarterly progress reports to designated DOE-ID personnel.
   - Ensure that ARLFRD activities comply with all applicable Occupational Safety and Health Administration, U.S. Department of Commerce, and NOAA safety regulations.
   - Respond to DOE-ID management requests for meteorological expertise and advice.
   - Participate as requested in DOE-ID public outreach programs and meetings.
   - Provide a representative for the INL Monitoring and Surveillance Committee and other appropriate INL environmental and emergency management organizations.
   - Ensure ARLFRD activities are in compliance with DOE orders and other regulations related to Mesonet operations and plume modeling.

2. **NOAA/INL Mesonet Operation**
   - Operate and maintain the existing 34-station NOAA/INL Mesonet, including radio repeaters, meteorological and telemetry equipment, and data recording systems. ARLFRD will also coordinate with INL staff in testing communications with a DOE-owned mobile meteorological station installed on a bus.
   - Ensure that the NOAA/INL Mesonet data recovery rate equals or exceeds the required 90% minimum.
   - As part of the NOAA/INL Mesonet, operate and maintain the 4 Idaho Environmental Monitoring Program (IEMP) meteorological stations. Coordinate data collection and dissemination with the other IEMP participants.
   - Operate and maintain the remote sensing systems that provide vertical profiles of wind, temperature, and turbulence above the INL. Currently, this includes a radar wind profiler with radio acoustic sounding system (RASS) and a high-resolution minisodar.
   - Operate and maintain the meteorological flux station at Grid 3 for direct measurement of atmospheric turbulence and stability near the surface.
   - Provide on/off control at ARLFRD for high-volume air samplers installed and maintained by the INL Site contractor at NOAA/INL Mesonet stations.
   - Acquire appropriate supporting meteorological and nuclear radiation data (without additional cost to DOE-ID) to enhance the NOAA/INL Mesonet database, such as pressurized ionization chamber data from the state of Idaho, the INL contractor, and the Environmental Surveillance, Education, and Research (ESER) Program.
   - Archive all NOAA/INL Mesonet data and maintain archive redundancy.
   - Provide continuous automated quality control of NOAA/INL Mesonet data. In addition, provide timely manual review and quality control of the data to ensure compliance with best practices.
   - Maintain quality assurance capability within the ARLFRD staff.
   - Perform semiannual calibrations on all meteorological equipment.
   - Perform periodic system accuracy calculations as needed.
   - Conduct physical and safety audits at tower locations according to the NOAA/INL Mesonet quality assurance plan. Perform maintenance as needed.
   - Annually review and update the NOAA/INL Mesonet quality assurance plan and procedures.
   - Collect additional meteorological data of interest to the INL to enhance forecasting and other efforts, such as weather radar data and images, meteorological satellite images, lightning detection data, fire weather observations, and numerical weather forecast model output.

3. NOAA/INL Mesonet Data Distribution

- Distribute real-time NOAA/INL Mesonet data to DOE-ID and INL clients through various Internet services. This includes observations from the towers and the remote sensors.
- Maintain and improve the NOAA/INL Weather Center web site as the primary distribution method for Mesonet data.
- Provide training to DOE-ID and contractor personnel on an as-needed basis for any meteorological applications supported by ARLFRD.
- Distribute real-time NOAA/INL Mesonet data to external organizations both to support NOAA's overall mission and to enhance the science value of the data. ARLFRD will determine on a case-by-case basis whether such external data transfers are advantageous. Entities currently receiving the data include the National Weather Service forecast office in Pocatello, the University of Utah (for their MesoWest program), and NOAA's Meteorological Assimilation Data Ingest System (MADIS).
- Provide Mesonet data to the National Atmospheric Release Advisory Center (NARAC) as required by DOE orders.
- Maintain the telephone teller system to provide continuous telephone access to real-time NOAA/INL Mesonet data.
- Provide support during normal working hours for telephone requests related to NOAA/INL Mesonet observations.
- Provide targeted monthly and annual NOAA/INL Mesonet climatological statistics to DOE-ID, INL, and outside agency personnel.
- Create custom data sets from the archived Mesonet data to support INL Site activities, as requested by DOE-ID and INL Site contractors. If the creation of a custom data set requires more than four staff hours of effort, ARLFRD may consider the activity to fall outside of this SOW. In such cases, ARLFRD is not obligated to provide the data set without a separate agreement.
- Provide the climatological data required to develop dose assessments in the annual National Emission Standards for Hazardous Air Pollutants (NESHAP) report.
- Complete a new edition of the INL climatology report covering observations up through 2020.

4. INL Weather Forecasts and EOC Support

- Maintain and improve the current INL forecast system for the different local climate zones at the Site. The NOAA/INL Weather Center web page will be the central access point for all INL forecast products generated by ARLFRD.
- Issue notices of significant weather events such as thunderstorms, lightning, blizzards, and high winds to the Warning Communication Center (WCC) and other designated INL entities during normal ARLFRD business hours. These notices will also be posted on the NOAA/INL Weather Center web page.
- In addition to routine INL forecasts, provide custom forecasts to DOE-ID or INL Site contractors in support of special activities affected by weather conditions. If the custom forecasts supporting an activity require more than four staff hours of effort in aggregate, ARLFRD may consider the work to fall outside this SOW. In such cases, ARLFRD is not obligated to provide the custom forecasts without a separate agreement.
- Provide on-call meteorologists to staff the EOC. The EOC meteorologist will run transport and dispersion models, provide interpretations of the model output, and provide weather nowcasts and short-term forecasts.
- Provide meteorological expertise to the EOC emergency response organization.
- Ensure proper operation of EOC computers operated by NOAA personnel.
- Participate in all suggested EOC drills, exercises, and training sessions.
- Provide custom meteorological data sets for EOC drills and exercises when requested.
- Coordinate all EOC plans and activities with the INL emergency management organization.

- Review and update NOAA EOC checklist procedures annually.

5. **Modeling and Research in Support of INL Activities and NOAA's Mission**
   - Operate and update, as appropriate, a mesoscale numerical forecast model to provide high-resolution weather simulations for southeastern Idaho.
   - Maintain and operate the NOAA HYSPLIT dispersion modeling system at the EOC to provide dispersion estimates based on either NOAA/INL Mesonet data or forecast meteorology from numerical models.
   - Provide ARLFRD dispersion model training to DOE-ID and contractor personnel on an as-needed basis.
   - Provide atmospheric dispersion model output for the annual INL Site Environmental Report using a special configuration of the NOAA HYSPLIT model.
   - Conduct applied research activities of common interest to NOAA and DOE-ID to improve understanding of plume dispersion and boundary layer processes. These activities may include atmospheric tracer studies for improved dispersion models or studies to improve the modeling of boundary layer structure.
   - Test, characterize, and evaluate new weather instruments, data loggers, radio transmitters, and measurement methods as appropriate to improve the quality of meteorological observations used for INL Site activities.

STAFFING LEVELS AND BUDGET

The staffing levels required to complete the SOW tasks are shown below. Values in the table represent the fractional number of full time equivalent (FTE) staff required annually to support each task. The agreement requires a supervisory meteorologist, an administrative officer, meteorologists, and support staff consisting of computer scientists or physical scientists, and electronic technicians. The total annual labor requirement equals 5.9 FTE.

Task	Supervisory Meteorologist	Administrative Officer	Meteorologist	Computer/ physical Scientist	Electronic Technician	Total
1	0.25	0.38	0.05			0.68
2			0.10	0.40	1.60	2.10
3			0.30	0.50		0.80
4			0.65	0.50		1.15
5	0.17		0.75	0.25		1.17
Total	0.42	0.38	1.85	1.65	1.60	5.90

Tasks covered under past agreements between NOAA and DOE-ID have been undertaken by a mixture of federal and contract employees. This will continue in the fiscal year 2019-2023 agreement, but anticipated staff changes are expected to result in a larger fraction of the tasks being supported by contract staff. The electronic technicians have long been contract staff. For this agreement, a portion of the meteorologist labor will be contract staff.

The total cost for the first fiscal year of the agreement is $1,409,092. This includes funds provided directly to NOAA through the agreement (further discussed in the section) and funds provided to BEA to provide support to NOAA (further discussed under "Other Expenses" below). The cost breakdown for first fiscal year is as follows:

Cost Category	Scope Funded	FY-2019 Cost
Federal Labor	Interagency Agreement	$ 989,401
Contract Labor	Interagency Agreement	$ 241,149
Building rent, leases, general administration	Interagency Agreement	$ 70,042
Transportation	Interagency Agreement	$ 16,500
Office supplies and services	Interagency Agreement	$ 17,000
Subtotal (NOAA costs)		$1,334,092
Services, Supplies, Equipment	BEA Support Account	$ 75,000
Total (NOAA and BEA costs)		$1,409,092

Federal labor costs include leave, benefits, and NOAA overheads that are assumed to apply at an average rate of 1.302 in FY-2019. Overhead rates vary from year to year based on guidance received from NOAA. (Note that the overhead rates stated in previous agreements were higher, because they included a general and administrative charge to account for building rent and other non-labor charges at ARLFRD. These non-labor costs are now listed separately in the budget rather than being included in FTE overhead.) Contract employees are currently provided by ERT, Inc. Estimated costs for contract labor are based on the existing agreement between NOAA and ERT together with expected price escalation. ERT's General Services Administration schedule for 2015-2020 assumes 2.5% annual price increases for the hourly rates of its labor categories.

Costs in later years of the agreement are expected to account for any across-the-board federal pay increases passed by Congress and the President. Also, ARLFRD participates in the Commerce Alternative Personnel System (CAPS), which forgoes the automatic step increases in the General Schedule for performance-based annual increases within pay bands. CAPS annual performance increases will occur during the agreement period in addition to any across-the-board increases. With the national inflation rate currently close to 2% and the ERT annual cost escalation set at 2.5%, a reasonable target for annual cost increases during fiscal years 2020 to 2023 of the agreement is between 2% and 2.5%. DOE-ID will make a best effort to account for cost increases over the duration of the agreement, although both NOAA and DOE-ID recognize the uncertainties associated with federal budgets in future years.

NOAA leases a GSA utility truck to carry parts, equipment, and personnel to the various meteorological stations. This vehicle is used almost exclusively to maintain the NOAA/INL Mesonet. A second GSA vehicle (currently a van) is used in part to transport NOAA staff to meetings and EOC activities falling under the agreement and to visit Mesonet stations for safety inspections or other tasks that do not require the utility truck. The transportation item in the budget includes the estimated costs of leasing, fueling, and maintaining the utility truck together with a fraction of the annual costs for the van.

Tasks 3 and 4 include the provision of custom Mesonet data sets and weather forecasts to support INL Site activities. To avoid open-ended time obligations for ARLFRD staff, such custom support is automatically included in this SOW only if the aggregate labor required for a specific request totals no more than four hours. For requests exceeding this limit, the ARLFRD Director will have discretion in determining whether the work falls outside this SOW and therefore requires a separate agreement. Such decisions will depend on the required level of effort, staff availability, the costs associated with setting up a separate agreement, and whether the custom activity includes possible benefits for NOAA-supported activities at ARLFRD.

OTHER EXPENSES

In addition to staff labor and other direct operating costs listed above, ARLFRD will incur further indirect expenses related to meteorological equipment purchases, site leases, tower maintenance, radio communications, and other services and supplies required to support the agreement. As required by federal regulations, DOE-ID will reimburse NOAA for these costs using additional funding. Services and supplies may be purchased from or through the INL contractor or from another commercial source. NOAA will determine each supplier on a case-by-case basis using economic and technical criteria to ensure the Government receives the best value available. These equipment and maintenance costs have been covered with a support account managed by the INL contractor and currently funded at $75,000 annually. Annual increases required to maintain the purchasing power of this account over the duration of the agreement are assumed to be consistent the current inflation rate of 2%.

ARLFRD operates 34 meteorological stations and a radio repeater in support of the DOE-ID agreement. The support account pays for the leases and electricity at many but not all of these locations. Thirteen stations are within the INL Site boundary and therefore do not involve land leases or electrical power charges. For historical reasons, a complicated set of arrangements is in place for land leases and electricity at the off-site locations. NOAA is the lessee at some locations, but others are leased by DOE-ID, the INL Site contractor, or other partnering organizations. Some off-site stations have no-cost leases. The lessor is paying for electricity at certain stations. The important consideration for this SOW is the number of locations that require payments through the INL-managed support account. This account is currently supporting full-cost leases at seven locations, all with the INL contractor as the lessee. It is also paying for electricity at seven locations. NOAA is the lessee at three additional locations requiring payments, but those costs must be paid through direct funding (i.e. funding provided directly to NOAA through the IA).

The annual funding for the support account is mainly intended for routine equipment costs and services. Some of the core components at each meteorological station, in particular the dataloggers[1] and radios, are significantly more expensive and have therefore not been routinely upgraded using the support account. Instead, these costly components have been replaced throughout the Mesonet at roughly 10-15 year intervals using separate funding. The last general upgrade of the dataloggers and radios was in 2004. The current dataloggers are no longer supported by the manufacturer, and several years ago the Department of Commerce requested that the assigned Mesonet radio frequency be changed by 2019. ARLFRD is currently evaluating new dataloggers and radios in a small subset of stations.

The past practice of replacing all the dataloggers and radios at one time does entail risks. A particular model may work well in preliminary testing but develop unexpected problems later. Purchasing these more expensive items all at once also means they tend to wear out around the same time. Rather than an all-at-once strategy, a better approach may be to replace these components in subsets of the stations at staggered intervals. With either strategy, the support account at its current funding level is not sufficient to cover both routine expenses and upgrades of the dataloggers and radios. The estimated replacement cost is $110,000.

Another potentially large cost that could not be covered by the support account is a serious repair or total failure of the radar wind profiler or minisodar mentioned in Task 2. These profiling systems are significantly more expensive than typical equipment on the meteorological towers. Moreover, the radar profiler's aging components are no longer manufactured and at some point may not be repairable. While

[1] Dataloggers are specialized computers that read raw signals from instruments on the towers, perform calculations to convert the raw signals to end-user meteorological observations, and coordinate transmission of the observations via radio.

some problems that have developed with these systems have been repaired relatively inexpensively, ARLFRD may not be able to keep these systems operating without supplemental funds if a serious problem develops.

Internet services is another cost not covered by the support account. A separate five-year Interconnection Service Agreement (ISA) between NOAA and DOE-ID, dated June 21, 2016, specifies that DOE-ID through the INL contractor will provide ARLFRD with a connection to the Internet (attached). This connection will assist ARLFRD in accomplishing the purposes of this statement of work, such as NOAA/INL Mesonet data distribution. In addition, the ISA provides for management of the ARLFRD internet firewall by the INL contractor. DOE-ID provides separate funding to the INL contractor to perform the services identified in the ISA, which are estimated to cost approximately $15,000 per year.

Access to the ARLFRD building has been managed by the INL contractor for over 30 years. This service has been provided entirely without cost to NOAA and includes: 1) building key control, 2) after-hours door alarms monitored by WCC, and 3) occasional patrols of the parking lot by INL security. This service helps to secure sensitive NOAA equipment that is critical for the execution of this agreement. Furthermore, this security posture has been approved in regular building security audits and site visits required and provided by the NOAA Office of Security (OSY). This statement of work formalizes and continues NOAA building access as described for the life of the agreement.

Attachment: Interconnectivity Service Agreement between DOE-ID and NOAA, June 2016.